

Art Unit: 2878

DETAILED ACTION

This Office Action is in response to the Applicants' communication (RCE and Amendment) filed on 26 July 2010. In virtue of this communication, Claims 14-20 are currently presented in the instant application (wherein Claims 14-15 were withdrawn with traverse and have been cancelled by Examiner's Amendment, as set forth below).

CONTINUED EXAMINATION UNDER 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 26 July 2010 (and the associated amendment filed 22 June 2010) has been entered.

EXAMINER'S AMENDMENT

2. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

3. The application has been amended as follows:

- Claims 14-15 have been cancelled.

Art Unit: 2878

4. Authorization for this examiner's amendment was given in a telephone interview with Ms. Patricia Verlangieri on 21 October 2010.

REASONS FOR ALLOWANCE

5. Claims 16-20 are allowed.

6. The following is an examiner's statement of reasons for allowance:

With respect to Claim 16, a projection system comprising “an objective for refracting [an] imaging beam, having a refractive portion comprising lenses”, “a curved mirror for deflecting the imaging beam, which is located below the optical axis of the objective...wherein the curved mirror is either a hyperbolic mirror which is placed on the exit side of the objective in such a way that the axis of the hyperbola passing through the foci of the hyperbola coincides with the optical axis of the objective, or an aspheric mirror having an axisymmetric shape defining an optical axis that coincides with the optical axis of the objective”, and “at least two plane deflection surfaces...being placed in the path of the imaging beam between the objective and the curved mirror” renders the claim allowable.

While Takaura et al. (U.S. Patent No. 7,048,388 B2) teaches a projection system having a objective for refracting an image beam comprising lenses, an axisymmetric, aspheric mirror, and at least two curved deflectors disposed therebetween, it fails to teach or reasonably suggest a system wherein the curved mirror is “located below the optical axis of the objective” or wherein the intermediate, at least two deflection surfaces are planar (wherein replacing the curved

Art Unit: 2878

deflectors with planar deflectors would not have been obvious as such a combination would destroy the functionality/invention of the projection system as disclosed).

While Sakata et al. (Pub. No.: US 2003/0011753 A1) teaches a projector system having an objective lens group, an axisymmetric curved mirror, and a planar deflection mirror disposed therebetween, it fails to teach or reasonably suggest a system comprising “at least two” plane deflection surfaces, wherein the curved mirror is “located below the optical axis of the objective” wherein the curved mirror comprises a hyperbolic mirror or “an aspheric mirror having an axisymmetric shape **defining an optical axis that coincides with the optical axis of the objective**”.

While Sunaga (U.S. Patent No. 6,626,541 B2) teaches a projection system comprising an imaging system with an objective comprising an aperture stop, an axisymmetric curved mirror, and at least two plane deflection surfaces disposed therebetween, it fails to teach or reasonably suggest that the curved mirror is “located below the optical axis of the objective” wherein the curved mirror comprises a hyperbolic mirror or “an aspheric mirror having an axisymmetric shape **defining an optical axis that coincides with the optical axis of the objective**”.

While Sarayedine et al. (U.S. Patent No. 7,488,077 B2) teaches a projection system comprising an objective lens assembly, a hyperbolic curved mirror, and a planar mirror disposed therebetween, it fails to teach or reasonably suggest a system wherein the curved mirror is “located below the optical axis of the objective” or there are at least two planar, intermediate deflection surface.

While Bassi et al. (Pub. No.: US 2003/0231261 A1) teaches a projector system comprising an objective comprising a lens group, a hyperbolic curved mirror, and a curved

Art Unit: 2878

mirror disposed therebetween, it fails to teach or reasonably suggest a system wherein the curved mirror is “located below the optical axis of the objective” and comprises an aspheric mirror or “a hyperbolic mirror which is placed on the exit side of the objective **in such a way that the axis of the hyperbola passing through the foci of the hyperbola coincides with the optical axis of the objective**”, or a system wherein the intermediate, at least two deflection surfaces are planar (wherein replacing the curved deflector with planar deflectors would not have been obvious as such a combination would destroy the functionality/invention of the projection system as disclosed).

Based on the above evidence, as representatives of the closest prior art of record, the prior art of record fails to reasonably suggest, alone or in combination, the above cited limitations of Claim 16, rendering said claim allowable.

With respect to Claims 17-20, the claims are rendered allowable based on their dependency upon the allowable independent Claim 16.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled “Comments on Statement of Reasons for Allowance.”

CITATION OF RELEVANT PRIOR ART

Art Unit: 2878

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

- Prior Art Suzuki et al. (Pub. No.: US 2001/0050758 A1) teaches a projection system having an objective lens and a curved mirror having a coinciding optical axis;
- Prior Art Bassi et al. (U.S. Patent No. 7,714,943 B2) teaches a projection system having a objective lens, two intermediate mirrors (one of which is curved), and a curved mirror disposed below the optical axis of the objective lens (wherein the optical axis of the objective and the mirror do not coincide);
- Prior Art Yoshii et al. (U.S. Patent No. 6,752,500 B1) teaches a projector system having an objective optical system, two curved intermediate mirrors, and a curved mirror;
- Prior Art Chatani et al. (Pub. No.: US 2003/0090794 A1) teaches a projection system having a objective optical system, at least two curved intermediate mirrors, and a curved mirror.

INQUIRY

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jori S. Reilly-Diakun whose telephone number is (571) 270-7555. The examiner can normally be reached on 7:30 AM to 5 PM EST, Monday thru Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Georgia Epps can be reached on (571) 272-2328. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2878

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/J. S. R./
Examiner, Art Unit 2878
10/21/2010

/Georgia Y Epps/
Supervisory Patent Examiner, Art Unit
2878